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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,435	01/20/2006	Tetsuya Hayashi	529.45793X00	2189
20457 7590 12/31/2007 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873			EXAMINER BOR, HELENE CATHERINE	
			ART UNIT 3768	PAPER NUMBER
			MAIL DATE 12/31/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/565,435

Applicant(s)

HAYASHI ET AL.

Examiner

Helene Bor

Art Unit

3768

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

#### ***Claim Objections***

2. Claim 7, 8, 10 & 12 are objected to because of the following informalities: The claims state, "the variance" and lack antecedent basis. It is noted that proper antecedent basis exist for claim 6 with "a variance". However, Claims 7, 8, 10 & 12 are not depend from Claim 6. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

3. Claim 1-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Shiki et al. (US Patent No. 7,044,913), and further in view of Hossack et al. (US Patent No. 6,116,244).

**Claim 1-3, 5-6, 10 & 17:** Shiki teaches an ultrasound apparatus forming a tomogram of an examinee by transmitting/receiving an ultrasound wave via an ultrasound probe (Col. 12, Line 63-67). Shiki teaches a color Doppler image forming means (Col. 12, Line 56-62). Shiki teaches image processing means for both the tomogram and the Doppler image (Figure 1, Element 4 & 5) and a display (Figure 1, Element 6) to display the images (Col. 13, Line 31-43). Shiki fails to teach a degree of transparency of the color Doppler image. However, Hossack teaches controlling a degree of the transparency [opacity] of the color Doppler image based on blood flow information or variance of a blood flow (Col. 2, Line 25-35 & Col. 3, Line 33-43 & Line 25-31) in order to emphasize the clinical areas of interest in the display (Col. 2, Line 33-35). It would have been

obvious to one of ordinary skill in the art to modify the displaying means of Shiki to include the transparency control means of Hossack in order to emphasize the clinical areas of interest in the display (Col. 2, Line 33-35).

**Claim 7, 8 & 15:** Shiki teaches displaying blood flow (Col. 10, Line 25-33). Shiki fails to teach controlling a degree of transparency of the color Doppler image. However, Hossack teaches wherein the transparency in a color Doppler image is reduced with an increase in the variance of the blood flow (Col. 1, Line 64 – Col. 2, Line 4). Also Hossack teaches an opaque image when the variance is maximum, a transparent image when the variance is null and a semi-transparent image when the variance is in between (Col. 4, Line 14-17 & Col. 5, Line 5-19) in order to emphasize the clinical areas of interest in the display (Col. 2, Line 33-35). Shiki and Hossack do not teach the exact color assignments as written in Claim 15, however, it would have been an obvious matter of design choice to change which color corresponds to which velocity or variance value, since the applicant has not disclosed that the color differences solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with different colors schemes.

**Claim 9:** Shiki teaches displaying color bars (Col. 20, Line 25-31). Shiki fails to teach transparency in the color Doppler image. However, Hossack teaches transparency [opacity] in the color Doppler image (Col. 2, Line 25-35 & Col. 3, Line 33-43 & Line 25-31) in order to emphasize the clinical areas of interest in the display (Col. 2, Line 33-35).

**Claim 11 & 13:** Shiki teaches controlling a luminance/hue of the color Doppler image (Col. 20, Line 25-63) and producing a three-dimensional color Doppler image (Col. 8, Line 1-9).

**Claim 12 & 18-20:** Shiki teaches arranging a speed/reflection intensity data of the Doppler signal in each of the three-dimensional voxels (Col. 5, Line 32-58). Shiki teaches means for deciding a luminance/hue of each of the three-dimensional voxels based on the speed (Col. 8, Line 50-56). Shiki fails to teach the transparency. However, Hossack teaches means for deciding transparency of each of the three-dimensional voxels based on variance (Col. 3, Line 9-31) in order to emphasize the clinical areas of interest in the display (Col. 2, Line 33-35).

**Claim 14:** Shiki teaches a phase comparator (Col. 12, Line 47-51), a MTI filter (Col. 32, Line 23-25), an autocorrelation calculation means (Figure 5 (b)), a digital scan converter (Figure 19 (a, b & c)), and a color encoder (Col. 8, Line 50-56)

**Claim 16:** Shiki teach wherein the image processing means comprises storage means for storing data of a plurality of color Doppler images (Col. 23, Line 20-23).

#### ***Response to Arguments***

4. Applicant's corrections, see Page 10, filed 10/01/2007, with respect to the drawings/specification have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

5. Applicant's arguments, see Page 10, filed 10/01/2007, with respect to the rejection(s) of claim(s) 1-18 under U.S.C 35 §103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further

consideration, a new ground(s) of rejection is made in view of Shiki et al. (US Patent No. 7,044,913), and further in view of Hossack et al. (US Patent No. 6,116,244).

**Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Kikuchi; Hayato et al. Ultrasonic image processing apparatus for constructing three-dimensional image using volume-rendering data and surface-rendering data simultaneously US 6254540 B1 20010703.
- b. Schwartz; Gary Allen Three dimensional medical ultrasonic diagnostic image of tissue texture and vasculature US 5720291 A  
USPAT 19980224.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Bor whose telephone number is 571-272-2947. The examiner can normally be reached on M-T 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

hcb

  
ERIC F. WINAKUR  
PRIMARY EXAMINER